

CLAIMS

1. A method of passing a message to a target receiver at a known location, wherein the
5 message is carried towards the target receiver by one or more mobile entities that receive and pass on the message by short-range communication, the message including an indication of the location of the target receiver, and at least one of the mobile entities is used to carry the message only following a determination that its direction of travel is appropriate to progress the message on its way to the target receiver.
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2. A method according to claim 1, wherein a said at least one mobile entity is determined to be travelling in an appropriate direction upon this direction approximating to the direction towards the target receiver.
- 15 3. A method according to claim 1, wherein a said at least one mobile entity is determined to be travelling in an appropriate direction upon this direction taking it along a map route in a direction reducing the route distance to the target receiver.
4. A method according to claim 1, wherein a said at least one mobile entity is determined
20 to be travelling in an appropriate direction upon this direction approximating to the direction towards an intermediate location predetermined as being one where the message is at least likely to encounter another mobile entity, or other means, for progressing the message towards the target receiver
- 25 5. A method according to claim 1, wherein said determination is effected by an entity already holding the message.
6. A method according to claim 5, wherein the message-holding entity effects said determination by the steps of:
30 - receiving, from the nearby said at least one of the mobile entities, the latter's direction of travel;

- deriving, as a reference direction, the direction from its own location to that of the target receiver or of an intermediate location predetermined as being one where the message is at least likely to encounter another mobile entity, or other means, for progressing the message towards the target receiver; and

5 - comparing the said direction of travel of the nearby mobile entity with the reference direction and determining that the nearby mobile entity is appropriate to carry to the message only upon the compared directions being within a predetermined angular range of each other.

10 7. A method according to claim 1, wherein said determination is effected by the concerned said at least one of the mobile entities.

8. A method according to claim 7, wherein the concerned said at least one of the mobile entities effects said determination by the steps of:

15 - receiving a reference direction from the entity already holding the message, this reference direction being the direction from the location of the message-holding entity to that of the target receiver or of an intermediate location predetermined as being one where the message is at least likely to encounter another mobile entity, or other means, for progressing the message towards the target receiver; and

20 - comparing the said direction of travel of said at least one of the mobile entities with the reference direction and determining that it is appropriate to carry to the message only upon the compared directions being within a predetermined angular range of each other.

25 9. A method according to claim 7, wherein the concerned said at least one of the mobile entities effects said determination by the steps of:

- receiving, from the entity already holding the message, the location of the target receiver or of an intermediate location predetermined as being one where the message is at least likely to encounter another mobile entity, or other means, for progressing the message towards the target receiver;

30 - deriving, as a reference direction, the direction from its current location to the received location; and

- comparing its direction of travel with the reference direction and determining that it is appropriate to carry to the message only upon the compared directions being within a predetermined angular range of each other.

5 10. A method according to claim 1, wherein a said at least one mobile entity, when carrying the message, seeks to pass on the message to another mobile entity upon its direction of travel no longer being appropriate to progress the message on its way to the target receiver.

10 11. A method according to claim 1, wherein a said at least one mobile entity, when carrying the message, opportunistically passes the message to another mobile entity that is travelling in a direction more closely aligned to one appropriate to progress the message on its way to the target receiver.

15 12. A method according to claim 1, wherein a said at least one mobile entity, when carrying the message, opportunistically passes the message to another mobile entity that is travelling, at a substantially greater speed than the current message-carrying entity, in a direction appropriate to progress the message on its way to the target receiver.

20 13. A method according to claim 1, wherein a said at least one mobile entity, when passing on the message, seeks to pass the message to multiple other mobile entities travelling in respective directions appropriate to progress the message on its way to the target.

25 14. A method according to claim 1, wherein a said at least one mobile entity, when passing on the message, is informed by the message-receiving mobile entity as to whether the latter has accepted to carry the message.

30 15. A method according to claim 1, wherein the message is routed through a communications infrastructure to a short-range transmitter close or closest to the target receiver and the latter then passes the message to a said at least one mobile entity.

16. A method according to claim 15, wherein the message is passed from an originating entity to the communications infrastructure via one or more mobile entities that are used to carry the message regardless of their direction of travel.

5 17. A method of passing a message to a target receiver at a known location, wherein the message is carried towards the target receiver by one or more mobile entities that receive and pass on the message by short-range communication, the message including an indication of the location of the target receiver, and at least one of the mobile entities knowing at least its approximate location and direction of travel and being used to carry the message only upon the entity travelling in a direction appropriate to progress the message towards the target.

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18. Apparatus for passing a message to a mobile entity travelling in a direction appropriate to progress the message on its way to a target receiver the location of which is indicated in the message, the apparatus comprising:

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- a short-range transceiver capable of determining the presence nearby of said mobile entity and of exchanging data with it;
- a location discovery arrangement by which the apparatus can know its location;
- a memory for holding the message; and

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- a send control subsystem for enabling the passing of the message, via the short-range transceiver, to said mobile entity only upon determining that the direction of travel of the mobile entity, as indicated by direction data received from the mobile entity, is appropriate to progress the message on its way to the target receiver.

25 19. Apparatus according to claim 18, wherein the send control subsystem comprises:

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- a direction-derivation arrangement for deriving, as a reference direction, the direction from its own location as indicated by said location discovery means, to that of the target receiver or of an intermediate location predetermined as being one where the message is at least likely to encounter another mobile entity, or other means, for progressing the message towards the target receiver; and
- a comparison arrangement for comparing the direction of travel of the nearby mobile entity with the reference direction and determining that the nearby mobile entity is

appropriate to carry to the message only upon the compared directions being within a predetermined angular range of each other.

20. A mobile entity for receiving a message, and storing it for carriage, when travelling in
5 a direction appropriate to progress the message on its way to a target receiver the location
of which is indicated in the message, the apparatus comprising:

- a short-range transceiver capable of determining the presence nearby of apparatus holding the message, and of exchanging data with the apparatus;
- a direction-of-travel discovery arrangement by which the mobile entity can determine
10 at least its general direction of travel;
- a memory for storing the message; and
- a receive control subsystem for enabling the storage for carriage of said message, only upon determining that the direction of travel of the mobile entity, is appropriate
15 to progress the message on its way to the target receiver as indicated by direction data received from the apparatus via the short-range subsystem.

21. A mobile entity for receiving a message, and storing it for carriage, when travelling in a direction appropriate to progress the message on its way to a target receiver the location of which is indicated in the message, the apparatus comprising:

- a short-range transceiver capable of determining the presence nearby of apparatus holding the message, and of exchanging data with the apparatus;
- a location and direction-of-travel discovery arrangement by which the mobile entity can determine at least its general location and direction of travel;
- a memory for storing the message; and
- a receive control subsystem for enabling the storage for carriage of said message, only upon determining that the direction of travel of the mobile entity, is appropriate
25 to progress the message on its way to the target receiver as indicated by a reference direction determined by the mobile entities current location and a location passed to it from the apparatus via the short-range subsystem.